PATENT APPLICATION
PO7934
MD02-75

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION OF	)
	)
RICK L. ADKINS ET AL	) GROUP ART UNIT: 1796
	)
SERIAL NUMBER: 10/687,156	) EXAMINER: Rabon A. Sergent
	)
FILED: October 16, 2003	) CONFIRMATION NO.: 7891
	)
TITLE: NOVEL UNSATURATED MACROMERS FOR PREFORMED STABILIZERS AND POLYMER POLYOLS	)

CORRECTED APPEAL BRIEF

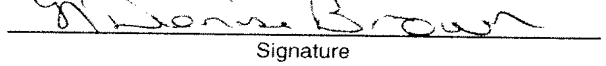
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the Notification of Non-Compliant Appeal Brief dated June 16, 2008 in the above identified application, Appellants are submitting a Corrected Appeal Brief. The present Brief is the same as the original Appeal Brief which Appellants filed on June 4, 2008 except for the concise explanation of the subject matter defined in each of the independent claims on appeal. Thus, in Section 5 of the present Brief which is titled "Summary of Claimed Subject Matter", Appellants have now substituted the phrase "Claim 11" for the phrase "Claim 1" in the first paragraph and in the first sentence of the second paragraph. This was an inadvertent typographical error.

I hereby certify that this correspondence is being deposited with the United States Patent Office by electronic mail on the date shown below:

N. Denise Brown, Reg. No. 36,097
Name of applicant, assignee or Registered Representative



Signature

June 27, 2008
Date

This Brief is an appeal from the Final Office Action of the Examiner dated January 9, 2008, in which the rejection of Claims 11-16, 19-27 and 29-31 was maintained. A Notice of Appeal was filed on April 9, 2008.

I. REAL PARTY IN INTEREST

This application is assigned to Bayer Polymers LLC. In 2004, Bayer Polymers LLC became Bayer MaterialScience LLC. Thus, Bayer MaterialScience LLC is the real party in interest.

II. RELATED APPEALS AND INTERFERENCES

There are no pending appeals or interferences which Appellants' are aware of that may be related to, would directly affect, would be affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

The above-referenced application was filed with Claims 1-53. No new claims were added during prosecution. In response to a restriction requirement under 35 U.S.C. 121, Appellants withdrew Claims 1-10 and 32-53 from consideration in an amendment filed October 26, 2005. Claim 18 was cancelled in an amendment dated May 3, 2006. In the original application, Appellants filed an amendment dated January 8, 2007 in response to the final rejection dated November 8, 2006, but the Examiner refused to enter this amendment. Thus, an RCE application was filed on February 8, 2007 to have the amendment entered. This amendment, which served to further define the invention of Claims 11 and 22 and cancelled Claims 17 and 28, was entered in the RCE. An amendment after final rejection was not presented by Appellants in the RCE application. Thus, Claims 11-16, 19-27 and 29-31 are pending but stand rejected. Claims 11-16, 19-27 and 29-31 are the subject claims of this appeal.

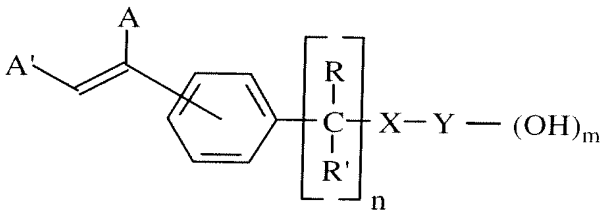
IV. STATUS OF AMENDMENTS

In the original application, Appellants filed an amendment in response to the final rejection dated November 8, 2006 but the Examiner refused to enter this amendment. Thus, an RCE was filed on February 8, 2007 to have the amendment entered. In the RCE application, no amendments were filed after the final rejection dated January 9, 2008.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Of the Claims on Appeal, Claims 11 and 22 are independent Claims. Claims 12-16 and 19-21 are directly or indirectly dependent on Claim 11; and Claims 23-27 and 29-31 are directly or indirectly dependent on Claim 22.

Claim 11 is directed to a process for preparing a pre-formed stabilizer. (See Page 9, Line 10-11.) (In order to assist the Honorable Board in its evaluation of the invention, reference will be made to the specification in which "P" will designate a page number and "L" will designate the line number(s)). This process comprises (A) free-radically polymerizing (1) from about 10 to 40% by weight, based on 100% by weight of the pre-formed stabilizer formulation, of an ethylenically unsaturated macromer which corresponds to a specific formula; with (2) from about 10 to 30% by weight, based on 100% by weight of the pre-formed stabilizer formulation, of at least one ethylenically unsaturated monomer; in the presence of (3) from about 0.01 to 2% by weight, based on 100% by weight of the pre-formed stabilizer formulation, of at least one free-radical polymerization initiator; and (4) from about 30 to 80% by weight, based on 100% by weight of the preformed stabilizer formulation, of a liquid diluent; and optionally, (5) a chain transfer agent. (See P9, L12 through P10, L23; P22, L8-9; and P27, L9-19 where Appellants incorporate by reference U.S. Patent 5,196,476; support for the relative quantities of components (1) through (4) is found in U.S. Patent 5,196,476 at column 13, lines 43-53 and column 15, lines 36-47, and specifically the table at column 15.) The ethylenically unsaturated macromer of Claim 11 corresponds to the formula:

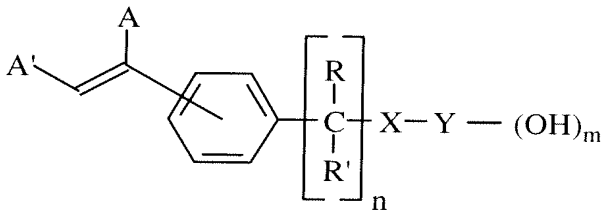


wherein:

A and A'	each independently represent a hydrogen atom, an alkyl radical containing from 1 to 10 carbon atoms which is optionally substituted with one or more halogen atoms, or an aryl radical containing from 5 to 6 carbon atoms which is optionally substituted with one or more halogen atoms;
n:	represents 0 or 1;
X:	represents an oxygen atom or a sulfur atom;
R and R':	each independently represent a hydrogen atom, or an alkyl radical containing from 1 to 10 carbon atoms which is optionally substituted with one or more oxygen atoms or one or more halogen atoms;
Y:	represents a polymerized form of at least one alkylene oxide containing from 2 to 8 carbon atoms in which the carbon atoms are aliphatically bound, aromatically bound, cycloaliphatically bound or a combination thereof;
and	
m:	represents 1. (See P9, L13 through P10, L15.)

Claim 22 is the other independent claim of this appeal. Claim 22 is directed to a pre-formed stabilizer. (See P10, L24-25.) This pre-formed stabilizer comprises the free-radical polymerization product of: (1) from about 10 to 40% by weight, based on 100% by weight of the pre-formed stabilizer formulation, of an ethylenically unsaturated macromer which corresponds to a specific formula; with (2) from about

10 to 30% by weight, based on 100% by weight of the pre-formed stabilizer formulation, of at least one ethylenically unsaturated monomer; in the presence of (3) from about 0.01 to 2% by weight, based on 100% by weight of the pre-formed stabilizer formulation, of at least one free-radical polymerization initiator; and (4) from about 30 to 80% by weight, based on 100% by weight of the preformed stabilizer formulation, of a liquid diluent; and optionally, (5) a chain transfer agent. (See P10, L25 through P11, L4; P22, L8-9; and P27, L9-19 where Appellants incorporate by reference U.S. Patent 5,196,476; support for the relative quantities of components (1) through (4) is found in U.S. Patent 5,196,476 at column 13, lines 43-53 and column 15, lines 36-47, and specifically the table at column 15.) The ethylenically unsaturated macromer of Claim 22 corresponds to the formula:



wherein:

A and A'	each independently represent a hydrogen atom, an alkyl radical containing from 1 to 10 carbon atoms which is optionally substituted with one or more halogen atoms, or an aryl radical containing from 5 to 6 carbon atoms which is optionally substituted with one or more halogen atoms;
n:	represents 0 or 1;
X:	represents an oxygen atom or a sulfur atom;
R and R':	each independently represent a hydrogen atom, or an alkyl radical containing from 1 to 10 carbon atoms which is optionally substituted with one or more oxygen atoms or one or more halogen atoms;
Y:	represents a polymerized form of at least one alkylene oxide containing from 2 to 8 carbon atoms in which the carbon atoms are aliphatically bound, aromatically bound, cycloaliphatically bound or a

combination thereof;

and

m: represents 1. (See P9, L13 through P10, L15; and P10, L27-28.)

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 11-16, 19, 22-27 and 29 were rejected under 35 U.S.C. § 102(b) as being anticipated by the Hoffman reference, (WO 87/03886).

Claims 11-16, 19, 21-27, 29 and 31 were rejected under 35 U.S.C. § 102(b) as being unpatentable over the Holeschovsky et al reference (U.S. Patent 6,013,731).

Claims 20, 21, 30 and 31 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the Hoffman reference (WO 87/03886) in view of the Holeschovsky et al reference (U.S. Patent 6,013,731).

Claims 11-16, 19, 22-27 and 29 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the Yu reference (U.S. Patent 4,680,358).

VII. ARGUMENTS

CLAIMS 11-16, 19, 22-27 AND 29 WERE REJECTED UNDER 35 U.S.C. § 102(B) AS BEING ANTICIPATED BY THE HOFFMAN REFERENCE, WO 87/03886.

Appellants respectfully submit that the presently claimed invention is not properly rejected as being anticipated by the Hoffman reference.

The presently claimed invention is clearly directed to pre-formed stabilizers which are suitable for preparing polymer polyols. Pre-formed stabilizers of the present invention are not soluble in a base polyol. In fact, P2, L19 through P3, L4; P26, L27-31 and P27, L1-8 of the present specification clearly describe pre-formed stabilizers as co-polymer dispersions which have a low solids content. These co-polymer dispersions have a small particle size which enable to these particles to act

or function as seeds in preparing polymer polyols. Thus, it is readily apparent to one of ordinary skill in the art that the pre-formed stabilizers of the present invention are not soluble in a base polyol.

By comparison, the Hoffman reference discloses dispersants, a process for their preparation and the use of these dispersants in the preparation of polymer polyols. These dispersants are prepared by homo- or co-polymerizing a vinyl-terminated adduct with at least one ethylenically unsaturated monomer, in the presence of an active hydrogen compound as a solvent, in conditions in which the dispersant has a Brookfield viscosity of less than 25,000 cps (at 25°C) as a 20-35 wt.% solution of the polymer of the vinyl-terminated adduct in an active hydrogen-containing compound. See page 3, lines 15-32 and page 4, lines 24-30. These dispersants are clearly disclosed as being soluble in the base polyol. See page 3, lines 25-26 and page 4, lines 28-29 of the Hoffman reference.

Thus, it is evident that the dispersants of the Hoffman reference are soluble in the base polyol, but the presently claimed pre-formed stabilizers are actually co-polymer dispersions which have a low solids content. By definition, a dispersion is a two-phase system in which one phase consists of finely divided particles which are distributed throughout a bulk substance which is the continuous or external phase. In support of this position, Appellants direct the Honorable Board's attention to the definition of the term "dispersion" as set forth in Hawley's Condensed Chemical Dictionary, Eleventh Edition, Revised by N. Irving Sax and Richard J. Lewis. Sr., © 1987; p. 433. (See item A in Evidence Appendix.)

Appellants further submit that the Hoffman reference expressly discloses that "relative proportions of the vinyl-terminated adduct and the ethylenically unsaturated monomer (when used) are such that the dispersant has the required solubility" (see page 10, lines 5-10), and that "too much of the ethylenically unsaturated monomer can cause the formation of an insoluble dispersant, which is undesirable" (see page 10, lines 19-21). It is evident from the disclosure of this reference that the Hoffman dispersants are soluble in a base polyol. In fact, this reference clearly teaches that insoluble dispersants are undesirable. Accordingly, Appellants respectfully submit that the Hoffman reference teaches away from the presently claimed invention. As

discussed above, the pre-formed stabilizers of the present invention are by definition insoluble as these are actually dispersions.

The fact that the presently claimed pre-formed stabilizer is insoluble in a base polyol and the dispersants of the Hoffman reference are soluble in a base polyol supports Appellants' position that the Hoffman reference does not anticipate the presently claimed invention. These are these are clearly different compositions. If the dispersants of this reference and Appellants' pre-formed stabilizers were indeed the same composition as asserted by the Examiner in this anticipation rejection, these compositions would have the same properties, and both compositions would either be soluble in a base polyol or insoluble in a base polyol. Regardless of how the dispersants of this reference are formed, i.e. by homo- or co-polymerizing a vinyl-terminated adduct with an ethylenically unsaturated monomer (or mixture of monomers), the only useful dispersants described by this reference are those which are soluble in a base polyol.

It is respectfully submitted that since the dispersants of the Hoffman reference are inherently different than the pre-formed stabilizers of the presently claimed invention, these can not and do not anticipate Appellants' pre-formed stabilizers. Accordingly, the presently claimed invention is not properly rejected as being anticipated under 35 U.S.C. § 102(b) by the Hoffman reference

Furthermore, the dispersants in the working examples of the Hoffman reference are prepared from vinyl-terminated adducts which are prepared by reacting isocyanatoethyl methacrylate (IEM) with a relatively high molecular weight polyol (i.e. having a MW = 3100 to 4800, and functionality = 3). These vinyl-terminated adducts formed in the Hoffman reference do not correspond to the specified structure of the macromer required by the presently claimed invention. Thus, the vinyl-terminated adducts of this reference are "obviously" different than the macromer structure required by the present claims. In the Hoffman reference, see Example 1A on page 21, lines 10-31; Example 2A on page 23, lines 11-29; Examples 3-5 on page 24, lines 37-42; Example 7 on page 26, lines 10-13; Example 8 on page 27, lines 1-3; Example 10 on page 28, lines 1-5; and Example 11 on page 29, lines 5-16. It is evident that the vinyl-terminated adducts of this

reference do not correspond to the macromer structure which is required by the present invention.

In the Hoffman reference, these vinyl-terminated adducts are then used to prepare dispersants. See preparation of dispersants in Example 1B on page 21, line 35 through page 22, line 5; Example 2B on page 23, line 31 through page 24, line 4; Examples 3-5 on page 24, lines 43-45; Example 7 on page 26, lines 15-17; Example 8 on page 27, lines 4-6; Example 10 on page 28, lines 9-29; and Example 11 on page 29, lines 19-31. It is readily apparent that these dispersants of this reference are different than the pre-formed stabilizer of the present claims. As previously discussed, the vinyl-terminated adducts in the working examples of the reference do not correspond to the presently required macromers and the specified structure. It is also apparent that the relative amounts of components used to prepare the dispersants in the Hoffman reference is different than and does not overlap with, the relative amounts of the components required by the presently claimed invention.

In particular, the dispersant of Example 1 of the Hoffman reference was prepared from about 8.1% of a polyol, 89.8% of the vinyl-terminated adduct, 2% of monomers (SAN) and 0.2% of a catalyst (all %'s are by wt.). The dispersant of Example 2 was prepared from about 18% of a polyol, 78.1% of vinyl-terminated adduct, 2.6% of monomers (SAN) and 0.2% of a catalyst (all %'s are % by wt.). Essentially identical quantities were used in Examples 3-5 and 6-9 as in Example 2. Example 10 additionally used a chain transfer agent (carbon tetrachloride). When taking the chain transfer agent (CTA) into account, the dispersant of Example 10 was prepared from 7.4% of a polyol, 81.9% of a vinyl-terminated adduct, 5.6% monomers (SAN), 0.6% of a catalyst and 4.5% of CTA. Without the CTA, the dispersant of Example 10 was prepared from 7.8% of a polyol, 85.8% of a vinyl-terminated adduct, 5.8% monomers (SAN) and 0.6% of a catalyst. Finally, the dispersant of Example 11 was prepared from 18.3% of a polyol, 80.5% of a vinyl-terminated adduct, and 1.2% of a catalyst. No monomers (SAN) were used to prepare the dispersant in Example 11.

It is evident from the working examples of this reference as discussed above that the dispersants therein do not anticipate Appellants' pre-formed stabilizers. In fact, the dispersants of the Hoffman reference comprise (1) 78.1% to 89.7% of vinyl-terminated adduct; (2) 2 to 5.8% of styrene and/or acrylonitrile (i.e. ethylenically unsaturated monomers); (3) 0.2 to 1.2% of a catalyst; and (4) 7.4% to 18.3% of a polyol. In the presently claimed invention, the pre-formed stabilizers comprise (1) 10 to 40% by wt. of an ethylenically unsaturated macromer; (2) 10 to 30% by wt. of at least one ethylenically unsaturated monomer; (3) 0.01 to 2% of a free-radical polymerization initiator (i.e. a catalyst); and (4) 30 to 80% of a liquid diluent. Therefore, it is evident that there is no overlap between the presently claimed invention and the Hoffman reference.

Finally, the Hoffman reference leads the skilled artisan to believe that unsuitable dispersants result from high levels of ethylenically unsaturated monomers. However, high levels of monomers are required by the present invention.

Appellants respectfully submit that there is no evidence that following the express disclosure of this reference would ever result in the presently claimed invention. In fact, it is respectfully submitted that the express disclosure of the Hoffman reference teaches that dispersants that are insoluble in a base polyol are unsuitable for preparing polymer polyols, and that insoluble dispersants can be caused by too much of the ethylenically unsaturated monomer. See page 10, lines 19-21. In short, this reference leads the skilled artisan away from the presently claimed invention. The skilled artisan would not increase the quantity of ethylenically unsaturated monomer to the presently required level upon reading the Hoffman reference.

It is readily apparent that the presently claimed invention is not disclosed by the Hoffman reference with the specificity of an anticipatory reference. Appellants therefore submit that this rejection is in error and request that it be reversed. The allowance of Claims 11-16, 19, 22-27 and 29 is respectfully requested.

CLAIMS 11-16, 19, 21-27, 29 AND 31 WERE REJECTED UNDER 35 U.S.C. § 102(B) AS BEING UNPATENTABLE OVER THE HOLESCHOVSKY ET AL REFERENCE (U.S. PATENT 6,013,731).

Appellants respectfully submit that the presently claimed invention is not properly rejected as being anticipated by the Holeschovsky et al reference.

The Holeschovsky et al reference is the only reference relied on by the Examiner in the rejections of the January 9, 2008 Office Action that disclose and/or describe pre-formed stabilizers as they are defined in the present application. Therefore, it is Appellants' position that this is the only relevant reference cited and relied on in the final Office Action dated January 9, 2008.

As set forth in this reference, the stabilizer precursors for preparing pre-formed stabilizers containing induced unsaturation are prepared from low-intrinsic unsaturation containing polyols. Stabilizer precursors are commonly referred to as macromers or macromonomers (see column 4, lines 52-55), and these may be used directly in the preparation of polymer polyols (column 7, lines 8-17) or of pre-formed stabilizers. In preparing the pre-formed stabilizers of this reference, vinyl monomers are polymerized *in situ* in the stabilizer precursor (i.e. the macromer), and optionally, in the presence of a polyol or low molecular weight diluent. This results in a fine dispersion of vinyl polymer particles at relatively low solids content (see column 7, lines 18-24).

By comparing the stabilizer precursors used to form the pre-formed stabilizers in the Holeschovsky et al reference with the ethylenically unsaturated macromers required by the present invention, it is readily apparent that these are different. The pre-formed stabilizers of this reference are obtained from a stabilizer precursor prepared by adding induced unsaturation to a high equivalent weight, preferably a multi-functional, polyoxyalkylene polyether polyol which has very low intrinsic unsaturation (see column 4, lines 50-55). Both "low intrinsic unsaturation" and of "induced unsaturation" are discussed in detail in this reference at column 4, line 56 through column 7, line 8. Low intrinsic unsaturation refers to the unsaturation that unavoidably occurs during polyoxypropylation by rearrangement of reactant or product molecules to contain unsaturated sites (see column 5, lines 37-45). Induced

unsaturation is unsaturation that is intentionally introduced into the polyoxyalkylene polyether which is to be used as the stabilizer precursor (see column 5, lines 47-57). This can be done in numerous ways, including esterification with an unsaturated carboxylic acid or derivative thereof, reaction with another unsaturated, polyol-reactive species, reaction with molecules which contain both isocyanate functionality and a reactive unsaturated group, etc.

The Holeshovsky et al reference discloses that suitable polyoxyalkylene polyether polyols for preparing the stabilizer precursors must have intrinsic unsaturation lower than about 0.020 meq/g (see column 4, lines 35-36 and column 5, lines 42-44) and nominal functionalities of 1 or more, preferably 2 to 8 (column 5, lines 59-60). Thus, the stabilizer precursors of this reference have, on the average, from 0.01 to 2 mol of induced unsaturation per mol of stabilizer precursor, preferably 0.05 to 1.2 mol, and most preferably 0.2 to 1 mol (see column 7, lines 4-8). These stabilizer precursors of the Holeschovsky et al reference are typically di- and higher functional materials, and may be used directly in preparing polymer polyols (column 7, lines 9-10) or following dilution with a polyol (column 7, lines 11-17).

These stabilizer precursors may also be used to produce pre-formed stabilizers (column 7, lines 18-19). It is Appellants' position that this portion of the Holeschovsky et al reference is the most relevant part of this reference in assessing patentability of the presently claimed invention. The preformed stabilizers therein are prepared by polymerizing vinyl monomers *in situ* in the stabilizer precursors, optionally in the presence of additional polyol and/or low molecular weight diluent to form a dispersion of vinyl polymer particles at low solids content (see column 7, lines 19-33). Although the basic process for preparing the pre-formed stabilizers of the present invention can be similar or the same as that of the Holeschovsky et al reference, the present invention clearly requires different macromers than the stabilizer precursors of this reference. Accordingly, this reference does not anticipate the presently claimed invention as the presently required macromers are not disclosed or described therein.

In the Holeschovsky et al reference, it is expressly disclosed that the molecular weight of the stabilizer precursors varies inversely with the functionality of the low intrinsic unsaturation polyol which was used to prepare it. There is a minimum molecular weight necessary for the resultant stabilizer to be efficient, and this is governed by the formula set forth at column 8, lines 39-51. A stabilizer precursor formed from a low intrinsic unsaturation polyoxypropylene monol requires that the monol have a minimum molecular weight of about 3000 Da (column 8, lines 51-54). Stabilizer precursors prepared from low intrinsic unsaturation hexols require a minimum molecular weight of about 6000 (column 8, lines 54-56).

It is respectfully submitted that it is evident from the structure of the presently required ethylenically unsaturated macromer (i.e. component (1) in Claims 11 and 22), that the presently required macromer is always monofunctional, i.e. it contains only one (1) hydroxyl group. Thus, the only possible overlap between the presently claimed invention and the Holeschovsky et al reference is when the stabilizer precursor of this reference is a monol.

As previously discussed, however, the Holeschovsky et al reference requires the molecular weight of the low intrinsic unsaturation monol to be at least 3000 Da (see column 8, lines 38-54). By comparison, the maximum molecular weight of the monofunctional compound used in preparing the ethylenically unsaturated macromer (1) of the present invention is close to 1000. This monofunctional compound is reacted with an alkylene oxide which contains up to 8 carbon atoms. Thus, the molecular weight of the alkylene oxide component is also less than the minimum molecular weight of the low intrinsic unsaturation polyol component of this reference. The Holeschovsky et al reference clearly teaches that a minimum molecular weight for low intrinsic unsaturation monols is necessary to prepare "efficient stabilizers" (column 8, lines 42-44). This molecular weight is well above the typical molecular weight of the monofunctional component and or the alkylene oxide component used to prepare the ethylenically unsaturated macromers of the present invention. Accordingly, the Holeschovsky et al reference does not anticipate the presently claimed invention under 35 U.S.C. § 102(b).

Appellants further submit that the Holeschovsky et al reference discloses that the PMPO's prepared from the precursor stabilizers described therein and pre-formed stabilizers based on these precursor stabilizers have excellent filterability, low viscosity and small particle size that can not be matched by stabilizer precursors prepared without low intrinsic unsaturation polyols of the specified minimum molecular weight (see column 8, lines 22-44). In accordance with the present claim language, it is readily apparent the required ethylenically unsaturated macromers are prepared from a monofunctional compound corresponding to a specific structure and an alkylene oxide. Low intrinsic unsaturation monols and/or polyols and vinyl monomers are not required or used in the presently claimed invention. However, PMPO's prepared from the pre-formed stabilizers of the present claims have excellent filterability, low viscosity and small particle size. Thus, this reference does not disclose or describe the presently claimed invention with the specificity of an anticipatory reference.

In addition, one of ordinary skill in the art could not reasonably expect that a suitable macromer or pre-formed stabilizer could be prepared from a monofunctional compound corresponding to the specific structure required by Appellants and an alkylene oxide.

All of the examples of this reference use polyoxypropylene polyols with low intrinsic unsaturation (see Examples 1-5 at column 10, line 64 through column 11, line 63) except Comparative Example C1 (column 11, line 65 through column 12, line 16) which used a conventional polyol (i.e. one without low intrinsic unsaturation). These were used to prepare pre-formed stabilizers as described in Examples 6-10 at column 12, line 18 through column 13, line 24, and in turn to prepare polymer polyols (see Examples 11-16 at column 13, line 25 through column 15, line 20 and Comparative Example C2 at column 15, line 24 through column 16, line 2). From the information set forth in Table 1 at columns 15-16, one skilled in the art would not be motivated to use (1) a polyol (or monol) component that does not contain low intrinsic unsaturation and/or (2) a low functionality component such as a monol. The examples in Table 1 lead the skilled artisan to conclude that viscosity increases as low intrinsic unsaturation decreases and as functionality decreases.

Furthermore, the presently required combination would not be expected to improve the viscosity and the 700-mesh filterability in polymer polyols prepared from the ethylenically unsaturated macromers described in the present application. See Polymer Polyol Examples 4 and 5 in Table 2 on page 41 of the present application. These are prepared from Pre-formed Stabilizer 2a which was prepared from Macromer 1a. Macromer 1a in the present application contained 1 mol of induced unsaturation/mol polyol. Macromer 1a had a MW of about 6400 and a viscosity of about 2900 cSt at 25°C. Macromer 1b contained 0.71 mol of induced unsaturation/mol polyol, a molecular weight of about 600 and a viscosity of about 6500 cSt. These are clearly not low intrinsic unsaturation polyols (or monols). It is readily apparent, however, that the ethylenically unsaturated macromers required by the present invention have substantially lower viscosities than conventional macromers.

Example 2 of the present application used Macromers 1a and 1b were used to prepared pre-formed stabilizers (PFS) 2a and 2b, respectively. The PMPO's 3, 4 and 5 were then prepared from the pre-formed stabilizers 2b, 2a and 2a, respectively. It is evident from Table 2 on page 42 of the present application that PMPO's 4 and 5 have lower viscosity and improved filterability compared to PMPO 3. However, PMPO 3 was prepared from a pre-formed stabilizer in which the macromer was prepared from a 12000 molecular weight polyol with a functionality of 6. In fact, PMPO's 4 and 5 have low viscosities and good filterability comparable to that of the PMPO's in the Holeschovsky et al reference which used low intrinsic unsaturation polyols in preparing stabilizer precursors and pre-formed stabilizers from these stabilizer precursors. See PMPO's 11-16 in TABLE 1 at columns 15-16 of the '731 patent. Most notably is the fact that the viscosities and filterability are comparable in spite of the fact that PMPO's 4 and 5 of the present application have slightly higher solids contents (i.e. about 50% by wt.) than the PMPO's of this reference which have solids contents of about 45% by wt. This is clearly unexpected, particularly in view of the disclosure by Holeschovsky et al that the performance of stabilizers prepared

from polyols having conventional levels of unsaturation can not match that of the stabilizers prepared from low intrinsic unsaturation polyols. See column 8, lines 22-38.

With respect to the Examiner's position that Appellants claims are not commensurate in scope with regard to issues such as solubility, particle size, viscosity, etc. as stated in the Advisory Action, Appellants respectfully submit that such properties are inherent in the claimed compositions. It is well established that a composition and its properties can not be separated. Furthermore, with regard to any unexpected results of the present invention, there is no legal basis for the Examiner to require that unexpected results be claimed.

Appellants therefore submit that it is readily apparent that the Holeschovsky et al reference does not disclose or describe the same invention as that which Appellants are claiming. Thus, the present invention is not properly rejected as being anticipated under 35 U.S.C. § 102(b) by the Holeschovsky et al reference.

In spite of similarities between the process for preparing the presently claimed pre-formed stabilizers and the pre-formed stabilizers of this reference, the Holeschovsky et al reference teaches that macromers which have "conventional" levels of intrinsic unsaturation do not match the performance of the precursors and pre-formed stabilizers describe therein. Accordingly, the Holeschovsky et al reference teaches away from the presently claimed invention. Thus, it is respectfully submitted that this rejection is in error and Appellants request that it be reversed.

CLAIMS 20, 21, 30 AND 31 WERE REJECTED UNDER 35 U.S.C. § 103(A) AS BEING UNPATENTABLE OVER THE HOFFMAN REFERENCE (WO 87/03886) IN VIEW OF THE HOLESCHOVSKY ET AL REFERENCE (U.S. PATENT 6,013,731).

Appellants respectfully submit that the presently claimed invention is not properly rejected as being obvious over this combination of references.

One of ordinary skill in the art has no insight into the presently claimed invention from this combination of references. These claims, i.e. Claims 20, 21, 30 and 31, are specifically directed to the diluent used to prepare the claimed pre-

formed stabilizers. More specifically, the diluent of the present invention is either a monohydroxyl alcohol as in Claims 20 and 30, or a poly(oxypropyleneoxyethylene)-polyol having an oxyethylene content of less than about 50% by weight and containing low unsaturation as in Claims 21 and 31.

As set forth above with respect to the Hoffman reference, it is evident that the presently required pre-formed stabilizers are not disclosed or suggested therein. Rather, dispersants are described by this reference. Pre-formed stabilizers are clearly the subject of the present invention. As previously discussed, the dispersants of the Hoffman reference are soluble in base polyols and pre-formed stabilizers of the present invention are insoluble in base polyols. Therefore, regardless of what may be disclosed about suitable diluents by the Holeschovsky et al reference, combining these diluents with the dispersants of the Hoffman reference in the preparation of polymer polyols or in the preparation of the dispersants of the Hoffman reference does not result in the invention of Claims 20, 21, 30 and/or 31. Thus, the presently claimed invention is not rendered obvious under 35 U.S.C. § 103(a) by this combination of references.

Appellants further submit that it is apparent that the pre-formed stabilizers of the Holeschovsky et al reference are also different than the pre-formed stabilizers of the present application. See prior discussion of this reference. The presently claimed pre-formed stabilizers and/or macromers are not disclosed or described by the Holeschovsky et al reference. Thus, regardless of what information may be disclosed about active hydrogen-containing compounds as solvents (or diluents) for preparing dispersants by the Hoffman reference, the combination of these active hydrogen-containing compounds with the stabilizer precursors of the Holeschovsky et al reference to prepare pre-formed stabilizers also does not result in the presently claimed invention. Appellants respectfully submit that this combination of references does not clearly suggest the presently claimed invention to one of ordinary skill in the art. Accordingly, the presently claimed invention is not rendered obvious under 35 U.S.C. § 103(a) by this combination of references.

The fact that neither the Hoffman reference or the Holeschovsky et al reference describes the present ethylenically unsaturated macromers which are essential to the claimed pre-formed stabilizers makes it evident that this combination of references can not properly render the presently claimed invention obvious to one of ordinary skill in the art. In the absence of a reference which clearly describes these ethylenically unsaturated macromers, the present invention can not be properly rejected as being obvious under 35 U.S.C. § 103(a) in view of these references. Accordingly, Appellants respectfully submit that the rejection of Claims 20, 21, 30 and 31 as being obvious in view of the Hoffman reference combined with the Holeschovsky et al reference is in error and it is requested that this rejection be reversed.

CLAIMS 11-16, 19, 22-27 AND 29 WERE REJECTED UNDER 35 U.S.C. § 103(A) AS BEING UNPATENTABLE OVER THE YU REFERENCE (U.S. PATENT 4,680,358).

Appellants respectfully submit that the presently claimed invention is not properly rejected as being obvious over the Yu reference.

One of ordinary skill in the art has no insight into the presently claimed invention from this reference.

Appellants respectfully submit that the Yu reference also does not disclose or suggest pre-formed stabilizers as required by the present invention. Rather, the macromers described by Yu are disclosed as being useful as non-aqueous dispersants for sterically stabilized dispersion polymerizations since the terminally unsaturated head group anchors the dispersant by copolymerization with the monomer (e.g. acrylic acid) which is to be polymerized. (See column 9, lines 8-15.) These macromers may also be homopolymerized by free radical polymerization to form a polystyrene polymer with pendant polyether chains, as comonomers in various polymerization reactions with vinyl, acrylic or diene monomer in which the styryl head group of the macromers is copolymerizable. (See column 9, lines 29-38.) Also, the macromers may be copolymerized with reactive liquid polymers (RLPs) to form various copolymers (see column 10, line 17 through column 11, line 4). It is

also possible for the macromers to be connected by a diisocyanate to polyether and/or polyester diols, to be quaternized (i.e. aminated) to form oligomers, etc., and end-capping of the OH group on the macromer (see column 11, line 63 through column 12, line 59).

It is readily apparent that the Yu reference does not disclose any information about pre-formed stabilizers and/or a process for preparing pre-formed stabilizers from macromers. Nor does this reference disclose polymer polyols. The Yu reference is silent on each of these points.

Claims 11 and 22 of the present application require specific ranges of the required components for pre-formed stabilizers including (1) the ethylenically unsaturated macromer, (2) the ethylenically unsaturated monomer, (3) the free-radical polymerization initiator, and (4) the liquid diluent. In particular, the present claims require (1) from 10 to 40% by wt. of an ethylenically unsaturated macromer; (2) from 10 to 30% by wt. of at least one ethylenically unsaturated monomer; (3) from 0.01 to 2% by wt. of at least one catalyst; and (4) from 30 to 80% by wt. of a liquid diluent. The Yu reference simply does not disclose or suggest pre-formed stabilizers, a process for preparing pre-formed stabilizers, and/or the presently required ethylenically unsaturated macromers. Thus, the presently claimed invention is not properly rejected as being obvious in view of the Yu reference.

Example 2 of this reference is the only portion that contains any detail into the use of these homomacromers (specifically the PECH homomacromer from Example 1) as a dispersant for the precipitation polymerization of an unsaturated monomer (e.g. acrylic acid) in a solvent (benzene). More specifically, this example polymerizes 115 g of acrylic acid (an ethylenically unsaturated monomer) in 2 g of the PECH homomacromer (dispersant) from Example 1, 0.9 g of allyl pentaerythritol (a crosslinking agent), and 620 g of benzene (a solvent), in the presence of 0.14 g of lauroyl peroxide (a free radical initiator). However, this polymerization does not yield a pre-formed stabilizer as defined by the present invention. Rather, a liquid polymer is formed. This liquid polymer acts as a thickener in aqueous solutions (column 14, lines 52-61).

The relative quantities of components in Example 2 of this reference do not fall within the scope of the ranges of components required by the present invention. Example 2 contains about 1.6% of the macromer from Example 1 (i.e. PECH homomacromer), about 15.4% of ethylenically unsaturated monomer (i.e. acrylic acid), about 0.02% of free-radical initiator, and about 82.9% of solvent. Thus, the resultant polymer prepared in Example 2 used a smaller amount of the macromer than the quantity of ethylenically unsaturated macromers required by the present claim language. Also, the amount of solvent or diluent in this example is higher than that required by the present claim language.

Appellants direct the Board's attention to the fact that the present invention requires a quantity of ethylenically unsaturated macromers that exceeds more than 6 times (and specifically 6.25 times) that which is described in the Yu reference. In fact, the quantity of ethylenically unsaturated macromer in the present invention may be up to 25 times greater than the quantity of macromer used in the Yu reference. Although one skilled in the art may slightly vary amounts in an effort to optimize, a six-fold increase is more than a slight variation that might be considered by one skilled in the art when "optimizing" the Yu reference. Accordingly, the present invention is not fairly suggested by the Yu reference.

Regardless of what information is disclosed by the Yu reference about macromers, this reference alone simply does not suggest the presently claimed invention to one of ordinary skill in the art as it is silent with regard to pre-formed stabilizers and/or a process of preparing these. Accordingly, one of ordinary skill in the art has no insight into the present invention upon reading the Yu reference.

Finally, it is readily apparent that the disclosure of the Yu reference at column 10, lines 12-16 expressly states that "[B]y varying the ratio of conventional vinyl, acrylic, or diene to macromer (VII), and the number of ECH units in the macromer, each of the copolymers may be obtained with a wide range of properties ranging from hard plastic to soft elastomeric." Thus, copolymers prepared from the macromers in the Yu reference are hard plastic materials, soft elastomeric materials and everything in between. By comparison, the pre-formed stabilizers of the present invention are co-polymer dispersions which have a low solids content. As previously

discussed, these co-polymer dispersions have a small particle size which enables the particles to act as seeds in preparing polymer polyols. Pre-formed stabilizers are not soluble in base polyols. See discussion of pre-formed stabilizers in the present specification on page 2, line 19 through page 3, line 4; page 26, lines 27-31; and page 27, lines 1-8. In sum, a pre-formed stabilizer is a stable liquid dispersion of very small particles. The presently claimed pre-formed stabilizers are clearly not hard plastic materials, soft elastomeric materials or anything in between!

One of ordinary skill in the art knows and understands that pre-formed stabilizers and polymer polyols prepared from pre-formed stabilizers are stable, liquids with solids dispersed therein. The broad statement by Yu that one can vary "the ratio" of unsaturated materials to macromer, etc. to yield a variety of solid materials with a wide range of properties can not properly be construed as a suggestion to prepare a stable liquid co-polymer dispersion!

Appellants respectfully submit that sufficient information is not disclosed by the Yu reference which suggests the presently claimed invention to one of ordinary skill in the art. The skilled artisan would not be motivated to make the necessary changes to the Yu reference to "arrive at" the presently claimed pre-formed stabilizers. Therefore, it is respectfully submitted that the presently claimed invention is not properly rejected as being obvious under 35 U.S.C. § 103(a) by the Yu reference. It is respectfully submitted that this rejection is in error and request that it be reversed.

In view of the preceding arguments, Appellants' respectfully submit that each of the Examiner's rejections is in error and respectfully request that these rejections be reversed. The allowance of Claims 11-16, 19, 22-27 and 29 is respectfully requested.

Respectfully submitted,

By _____
N. Denise Brown
Agent for Appellants
Reg. No. 36,097

Bayer MaterialScience LLC
100 Bayer Road
Pittsburgh, Pennsylvania 15205-9741
(412) 777-3804
FACSIMILE PHONE NUMBER:
(412) 777-3902
s:\shared\jmf\DB7934.brf2

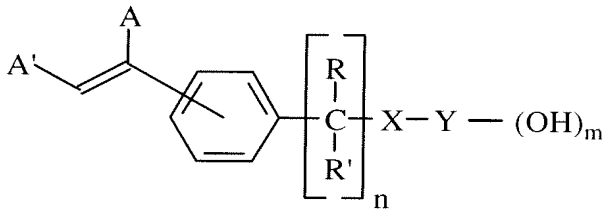
VIII. CLAIMS APPENDIX:

The following is a listing of the claims on Appeal.

Claim 11. A process for preparing a pre-formed stabilizer comprising:

(A) free-radically polymerizing:

(1) from about 10 to 40% by weight, based on 100% by weight of the pre-formed stabilizer formulation, of an ethylenically unsaturated macromer represented by the formula:



wherein:

A and A': each independently represent a hydrogen atom, an alkyl radical containing from 1 to 10 carbon atoms which is optionally substituted with one or more halogen atoms, or an aryl radical containing from 5 to 6 carbon atoms which is optionally substituted with one or more halogen atoms;

n: represents 0 or 1;

X: represents an oxygen atom or a sulfur atom

R and R': each independently represent a hydrogen atom, or an alkyl radical containing from 1 to 10 carbon atoms which is optionally substituted with one or more oxygen atoms or one or more halogen atoms;

Y: represents a polymerized form of at least one alkylene oxide containing from 2 to 8 carbon atoms in which the

carbon atoms are aliphatically bound, aromatically bound, cycloaliphatically bound or a combination thereof;

and

m: represents 1;

with

(2) from about 10 to 30% by weight, based on 100% by weight of the preformed stabilizer formulation, of at least one ethylenically unsaturated monomer;

in the presence of:

(3) from about 0.01 to 2% by weight, based on 100% by weight of the preformed stabilizer formulation, of at least one free-radical polymerization initiator;

and

(4) from about 30 to 80% by weight, based on 100% by weight of the preformed stabilizer formulation, of a liquid diluent;

and, optionally,

(5) a chain transfer agent.

Claim 12. The process of Claim 11, wherein (1) said ethylenically unsaturated macromer corresponds to the same formula, wherein:

A and A': each independently represents a hydrogen atom, a methyl group, an ethyl group, a propyl group, a butyl group, a hexyl group, a cyclohexyl group, a phenyl group, or a chloromethyl group;

n: represents 0 or 1;

X: represents an oxygen atom or a sulfur atom;

R and R': each independently represents a hydrogen atom, a methyl group, an ethyl group, a propyl group, a butyl group, a pentyl group, a cyclopentyl group, a hexyl group, a cyclohexyl group, or a phenyl group;

Y: represents a polymerized form of ethylene oxide, propylene oxide, butylene oxide, glycidol or mixtures thereof;

and

m: represents 1.

Claim 13. The process of Claim 11, wherein said ethylenically unsaturated macromer has a number average molecular weight of from about 170 to about 30,000.

Claim 14. The process of Claim 11, wherein (2) said ethylenically unsaturated monomer is selected from the group consisting of: styrene, acrylonitrile and mixtures thereof.

Claim 15. The process of Claim 14, wherein (2) said ethylenically unsaturated monomer comprises a mixture of styrene and acrylonitrile in a weight ratio of styrene to acrylonitrile of from about 80:20 to about 50:50.

Claim 16. The process of Claim 11, wherein (3) said free-radical polymerization initiator is selected from the group consisting of alkyl hydroperoxides, aryl hydroperoxides, persulfates, perborates, percarbonates, azo compounds and mixtures thereof.

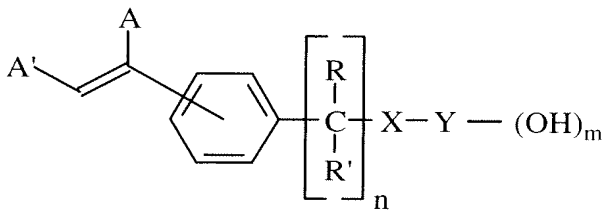
Claim 19. The process of Claim 11, wherein (4) said diluent is selected from the group consisting of monohydroxyl alcohols, polyols, hydrocarbons, ethers and mixtures thereof.

Claim 20. The process of Claim 19, wherein said monohydroxy alcohol is selected from the group consisting of methanol, ethanol, n-propanol, isopropanol, n-butanol, sec-butanol, tert-butanol, n-pentanol, 2-pentanol, 3-pentanol and mixtures thereof.

Claim 21. The process of Claim 19, wherein said polyol comprises an poly(oxypropyleneoxyethylene) polyol having an oxyethylene content of less than about 50% by weight, based on 100% by weight of oxyalkylene groups, and contains low unsaturation.

Claim 22. A pre-formed stabilizer comprising the free-radical polymerization product of:

(1) from about 10 to 40% by weight, based on 100% by weight of the pre-formed stabilizer formulation, of an ethylenically unsaturated macromer represented by the formula:



wherein:

A and A': each independently represent a hydrogen atom, an alkyl radical containing from 1 to 10 carbon atoms which is optionally substituted with one or more halogen atoms, or an aryl radical containing from 5 to 6 carbon atoms which is optionally substituted with one or more halogen atoms;

n: represents 0 or 1;

X: represents an oxygen atom or a sulfur atom;

R and R': each independently represent a hydrogen atom, or an alkyl radical containing from 1 to 10 carbon atoms which is optionally substituted with one or more oxygen atoms or one or more halogen atoms;

Y: represents a polymerized form of at least one alkylene oxide containing from 2 to 8 carbon atoms in which the

carbon atoms are aliphatically bound, aromatically bound, cycloaliphatically bound or a combination thereof;

and

m: represents 1;

with

(2) from about 10 to 30% by weight, based on 100% by weight of the pre-formed stabilizer formulation, of at least one ethylenically unsaturated monomer;

in the presence of

(3) from about 0.01 to 2% by weight, based on 100% by weight of the pre-formed stabilizer formulation, of at least one free-radical polymerization initiator;

and

(4) from about 30 to 80% by weight, based on 100% by weight of the pre-formed stabilizer formulation, of a liquid diluent;

and, optionally,

(5) a chain transfer agent.

Claim 23. The pre-formed stabilizer of Claim 22, wherein (1) said ethylenically unsaturated macromer is represented by the same formula, wherein:

A and A': each independently represents a hydrogen atom, a methyl group, an ethyl group, a propyl group, a butyl group, a hexyl group, a cyclohexyl group, a phenyl group, or a chloromethyl group;

n: represents 0 or 1;

X: represents an oxygen atom or a sulfur atom;

R and R': each independently represents a hydrogen atom, a methyl group, an ethyl group, a propyl group, a butyl group, a pentyl group, a cyclopentyl group, a hexyl group, a cyclohexyl group, or a phenyl group;

Y: represents a polymerized form of ethylene oxide, propylene oxide, butylene oxide, glycidol, or mixtures thereof;

and

m: represents 1.

Claim 24. The pre-formed stabilizer of Claim 22, wherein said ethylenically unsaturated macromer has a number average molecular weight of from about 170 to about 30,000.

Claim 25. The pre-formed stabilizer of Claim 22, wherein (2) said ethylenically unsaturated monomer is selected from the group consisting of: styrene, acrylonitrile and mixtures thereof.

Claim 26. The pre-formed stabilizer of Claim 22, wherein (2) said ethylenically unsaturated monomer comprises a mixture of styrene and acrylonitrile in a weight ratio of styrene to acrylonitrile of from about 80:20 to about 50:50.

Claim 27. The pre-formed stabilizer of Claim 22, wherein (3) said free-radical polymerization initiator is selected from the group consisting of alkyl hydroperoxides, aryl hydroperoxides, persulfates, perborates, percarbonates, azo compounds and mixtures thereof.

Claim 29. The pre-formed stabilizer of Claim 22, wherein (4) said diluent is selected from the group consisting of monohydroxyl alcohols, polyols, hydrocarbons, ethers and mixtures thereof.

Claim 30. The pre-formed stabilizer of Claim 29, wherein said monohydroxy alcohol is selected from the group consisting of methanol, ethanol, n-propanol, isopropanol, n-butanol, sec-butanol, tert-butanol, n-pentanol, 2-pentanol, 3-pentanol and mixtures thereof.

Claim 31. The pre-formed stabilizer of Claim 29, wherein said polyol comprises an poly(oxypropyleneoxyethylene) polyol having an oxyethylene content of less than about 50% by weight, based on 100% by weight of oxyalkylene groups, and contains low unsaturation.

IX. EVIDENCE APPENDIX:

A. Hawley's Condensed Chemical Dictionary, Eleventh Edition, Revised by N. Irving Sax and Richard J. Lewis. Sr., © 1987; p. 433.

X. RELATED PROCEEDINGS APPENDIX:

Appellants' have not identified any applications under Section II, titled "RELATED APPEALS AND INTERFERENCES". Accordingly, there is nothing to submit under this section.